

**GMR SENSOR WITH SHALLOW CONTIGUOUS JUNCTION AND BIAS  
LAYERS ALIGNED WITH FREE SENSOR LAYERS**

**ABSTRACT**

A magnetic sensor is disclosed having a shallow contiguous junction. Such a sensor is can greatly increase yield for mass-produced heads, especially for large wafers. The magnetic bias layers can be aligned with a free layer of the sensor, improving performance. Milling may be terminated prior to penetration of an antiferromagnetic layer, so that for example the antiferromagnetic layer may extend significantly beyond the free and pinned layers of the sensor.